NeuroMorphoVis: a framework for analysis and visualization of neuronal morphology skeletons reconstructed from microscopy stacks

Supplementary information

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1 Supplementary figures

1.1 Figure S1

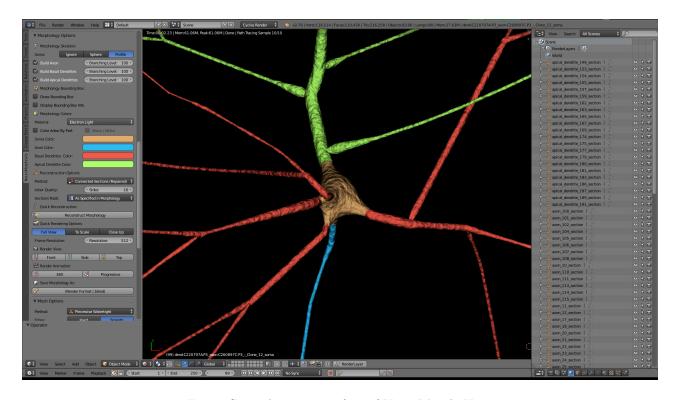


Figure S1: The user interface of NeuroMorphoVis.

1.2 Figure S2

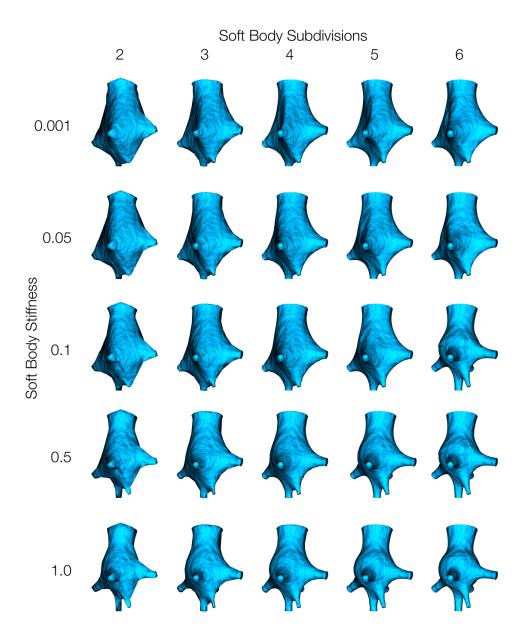


Figure S2: The effect of varying the parameters of the soma reconstruction module, mainly the number of soft body subdivisions and stiffness, is visually demonstrated on a layer 5 pyramidal neuron.

1.3 Figure S3

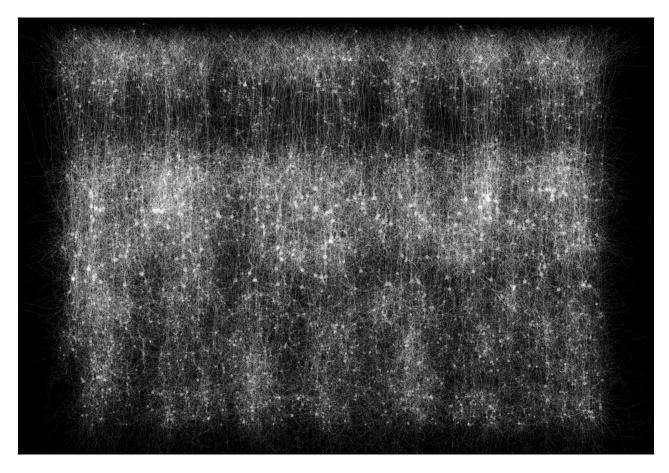


Figure S3: A fraction of 10% of a mesoscale circuit that is composed of 100, 000 neurons reflecting a digital slice extracted from the somatosensory cortex of rat brain.

2 Supplementary videos

2.1 Video V1

https://www.youtube.com/watch?v=v02HogkFODU

2.2 Video V2

 $https://www.youtube.com/watch?v{=}74PGirMx3ks\&t{=}74s$

2.3 Video V3

https://www.youtube.com/watch?v=oxCKwrZSV98

3 NeuroMorphoVis Installation

NeuroMorphoVis is an add-on that can be installed in Blender following the normal procedure of loading add-ons to the user interface via Blender User Preferences panel. In this section, we will demonstrate how to download and install it into Blender.

3.1 Dependencies

- 1. Blender 2.67, 2.77 or 2.78
- 2. HDF5 library, that can be installed on Ubuntu via sudo apt-get install python-h5 for python 2.7 or sudo apt-get install python3-h5 for python 3. This dependency is only requested if the user want to load .h5 morphologies only.

3.2 Repository

The framework is available under the GNU license at https://github.com/BlueBrain/NeuroMorphoVis.

3.3 Installation

The users can install Blender on Debian operating systems using sudo apt-get install blender or download a free version online from the Blender website.

For a system-installed Blender on Linux, the add-on can be cloned into the addons directory in the user home space as follows

- 1. Open the directory \$HOME/.config/blender/2.76/scripts/addons/.
- $2. \ \ Clone \ the \ repository \ {\tt git \ clone \ https://github.com/BlueBrain/NeuroMorphoVis.git}.$
- 3. Open Blender from the terminal using the command blender.
- 4. Open the User Preferences panel from the File menu, as shown in Figure S5.
- 5. Open the Add-ons tab and select NeuroMorphoVis, see Figure S4.
- 6. Select a morphology file and start processing it using the different modules of the tool shown in Figure S6.

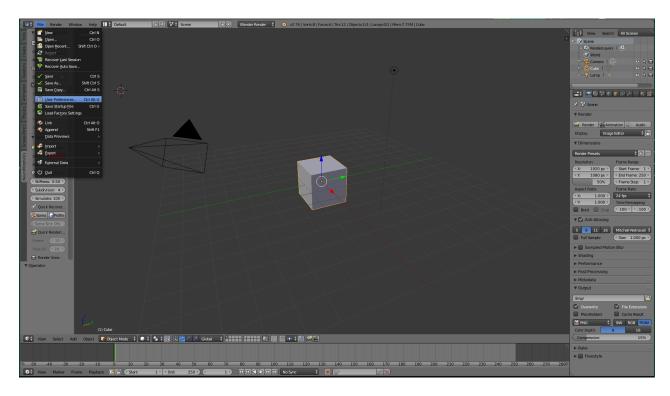
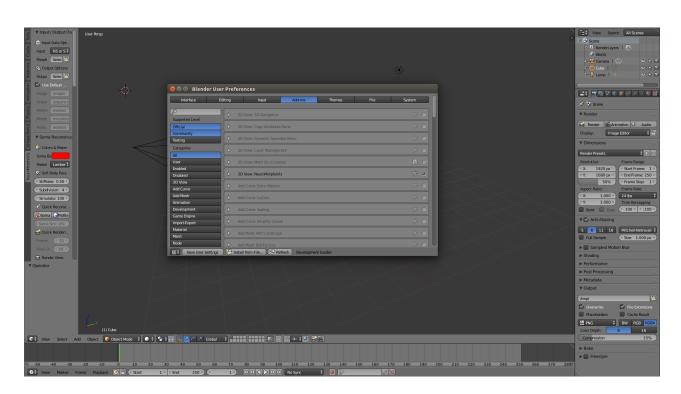


Figure S4: Opening the user preferences panel in Blender from the File menu.



 $Figure \ S5: \ \ Loading \ the \ NeuroMorphoVis \ add-on \ from \ the \ Blender \ Add-ons \ panel.$

& Analysis **Soma Reconstruction** Mesh & Analysis Reconstruction Ignore Sphere Profile Branching Level: 100 - Branching Level: 100 > Ocolors & Materials: Branching Level: A Piecewise Watertight Edges: Draw Bounding Box **Input & Output Data** Soft Body Parameters: Display Bounding Box Info Stiffness: 0.50 -Morphology Colors: Colors & Material ▼ Input / Output Data Material: 100 ■ Input Data Options: Color Arbor By Part Input Source: H5 or SWC File Mesh Color: Select Morphology 4 Output Options: Quick Rendering Options Ouick Rendering Options Select Directory Apical Dendrite Color: Render View: As Specified in Morpho Render Animation Render Animation: Reconstruct Morphology Quick Rendering Options: Full View Front Li → Save Morphology As: Blender Format (.blend)

Morphology Reconstruction

Figure S6: The interface of the different modules of NeuroMorphoVis.